

MICHIGAN STATE

U N I V E R S I T Y

09/06: Project Plan

The Capstone Experience

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Fall 2017



*From Students...
...to Professionals*

Project Plan

➤ Functional Specifications

- Design Specifications
- Technical Specifications

Functional Specifications

- What does it do?
(Not “how” does it do it?)
 - What’s your client’s problem?
 - What’s your solution?
- Includes
 - List of Objectives
 - Use Cases
- Not Necessarily Complete
- Understandable by End User
- Initial Problem Statement
- Usually Refined



Functional Specifications

- Amazon
 - Create Innovative Fashion Shopping Experience
 - With Virtual Personal Stylists
 - MSUFCU
 - Provide Virtual Banking Assistance
 - Using a Chatbot
 - Spectrum Health
 - Recommend Spectrum Health Services to Patients
 - Based on Symptoms They Provide
- Understandable
by End User



Functional Specifications Interactions With Your Client

- Derived With/From Client
- Documented For Client
- Presented to Client
- Agreed Upon With Client
- Your Job to Capture the Client's Intent!

Project Plan

✓ Functional Specifications

➤ Design Specifications

• Technical Specifications

Design Specifications

- What's the user experience (UX)?
 - How does a user use it?
 - How does it look and feel?
- Includes
 - Business Process Flow
 - Specific Features
 - Use Cases
 - Screen Mockups
 - Data Flow Diagrams
 - Data Organization
 - Etc...
- Identifies All the Parts and Their Interactions
- (Mostly) Understandable by End User
- Usually Refined



Design Specifications

- Auto-Owners
 - Design and Build Time-Based Virtual Reality Game
 - Build Virtual Model of Single-Family Home
 - Display Various Scenarios Inside and Outside
 - Hazardous
 - Safe
 - Innocuous
 - Support Various Levels of Difficulty
 - Provide Limited Hints
 - Use Randomization for Varied Experiences
 - Show Review Panel At Game End
- Meijer
 - Track Customer Shopping History
 - Determine Likely Existing Household Ingredients
 - Recommend Range of Recipes
 - Ingredient Availability
 - Food Preferences
 - Create Shopping List for Missing Ingredients
 - Integrate with mPerks
- Phoenix Group
 - Create Windows Tablet-Based Pick Ticket
 - Display Geolocation-Based Warehouse Map
 - Provide Bin Locations and Route Planning
 - Support Real-Time Shelf Counts
 - Handle Bar Codes

Mostly
Understandable
by End User



Screen Mockups

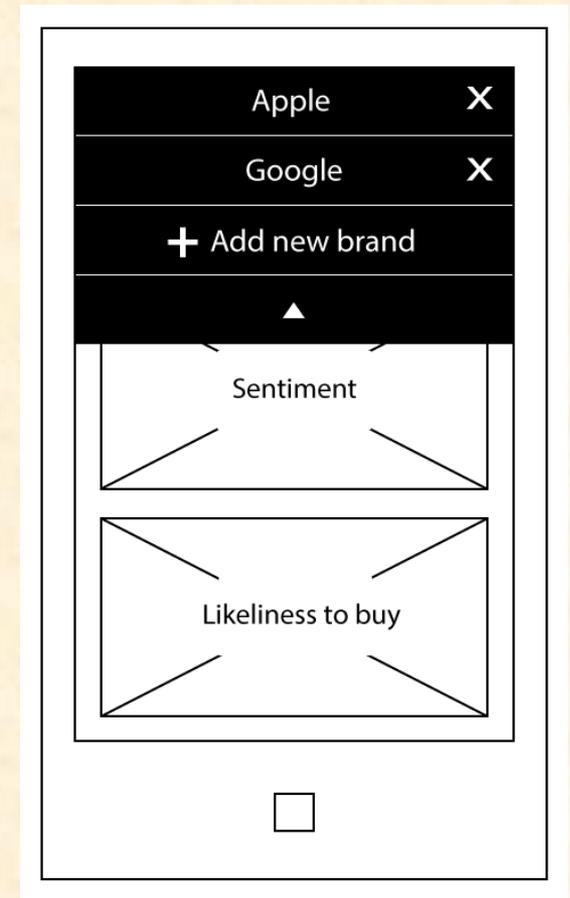
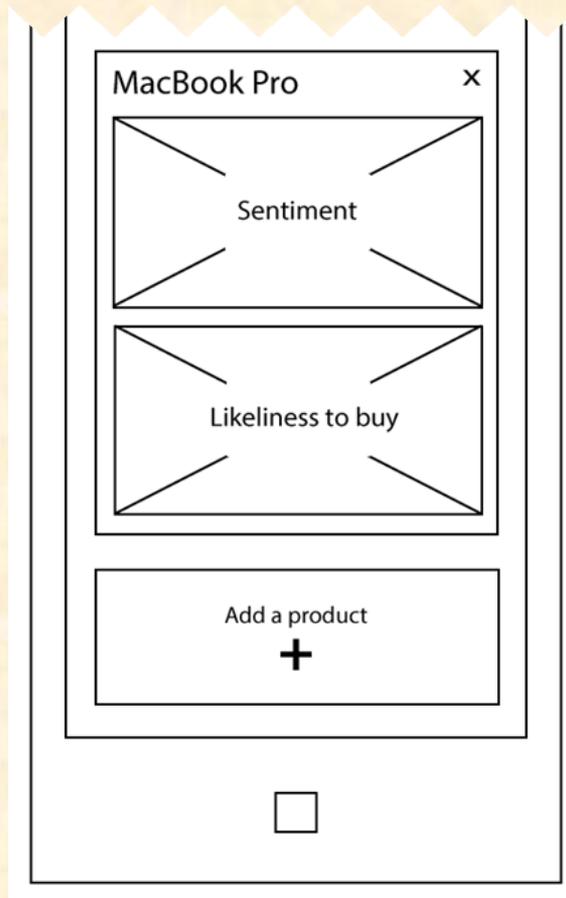
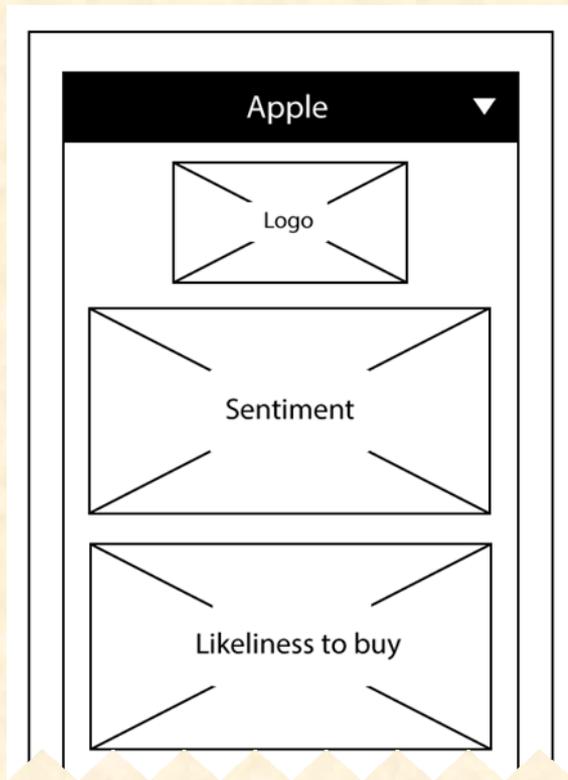
- User Interface Only
 - Shows Layout, Buttons, Pull-Downs, Etc...
 - Non-Functional
 - No Back End
- Helpful for Developing
 - Functional Specifications
 - Look-and-Feel
 - Use Cases
- Can Create with...
 - Pencil and Paper
 - PowerPoint (Developer View)
 - Photoshop
 - Etc...
- NOT Screen Captures of Other Software



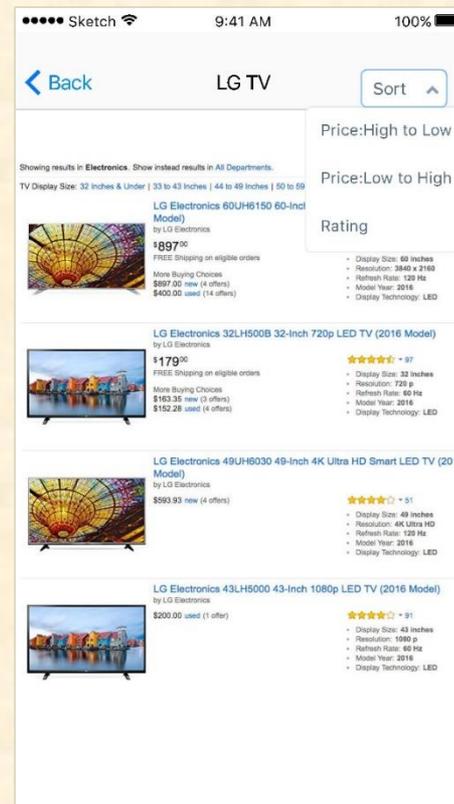
Screen Mockups

- “Use” with Clients
 - Show to Clients
 - Go Through Use Cases with Clients
- “Cruder” may be better.
 - What?
 - Why?

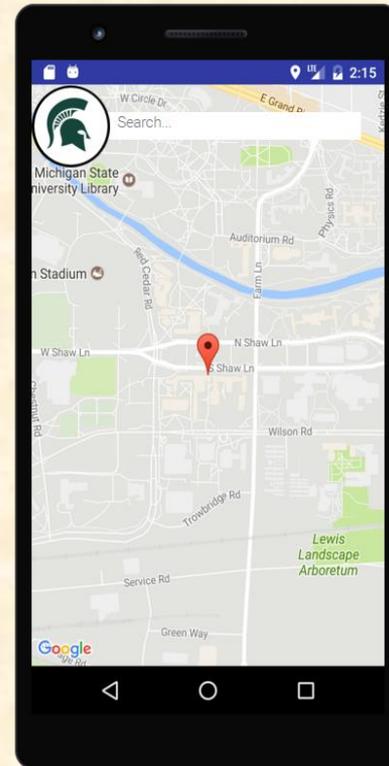
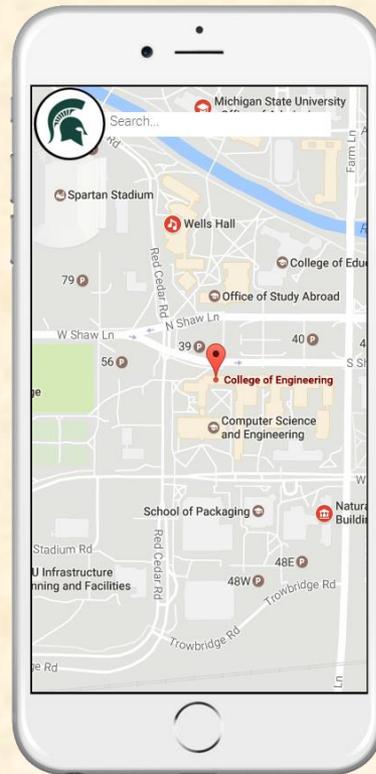
Screen Mockup Example



Screen Mockups Example



Screen Mockups Example



Design Specifications Interactions With Your Client

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Project Plan

✓ Functional Specifications

✓ Design Specifications

➤ **Technical Specifications**



Technical Specification

- How does it do it?
- Identifies All the Parts and Their Interactions
- Everything a Developer Needs to Write the Code
- Includes Things Like...
 - Overall System Architecture
 - Machine Architectures
 - Software Technologies
 - Production Environments
 - Development Environments
 - SDK's (Software Development Kits)
 - Network Topology
 - Database Schema
 - Continued...



Technical Specification

- Includes Things Like...
 - Object Models and Class Diagrams
 - UML Diagrams
 - Pseudo Code
 - Function Prototypes
 - Schedule
 - Test Plan
 - Risk Analysis
 - Etc...
- Probably Not Understandable by End User
- Usually Refined



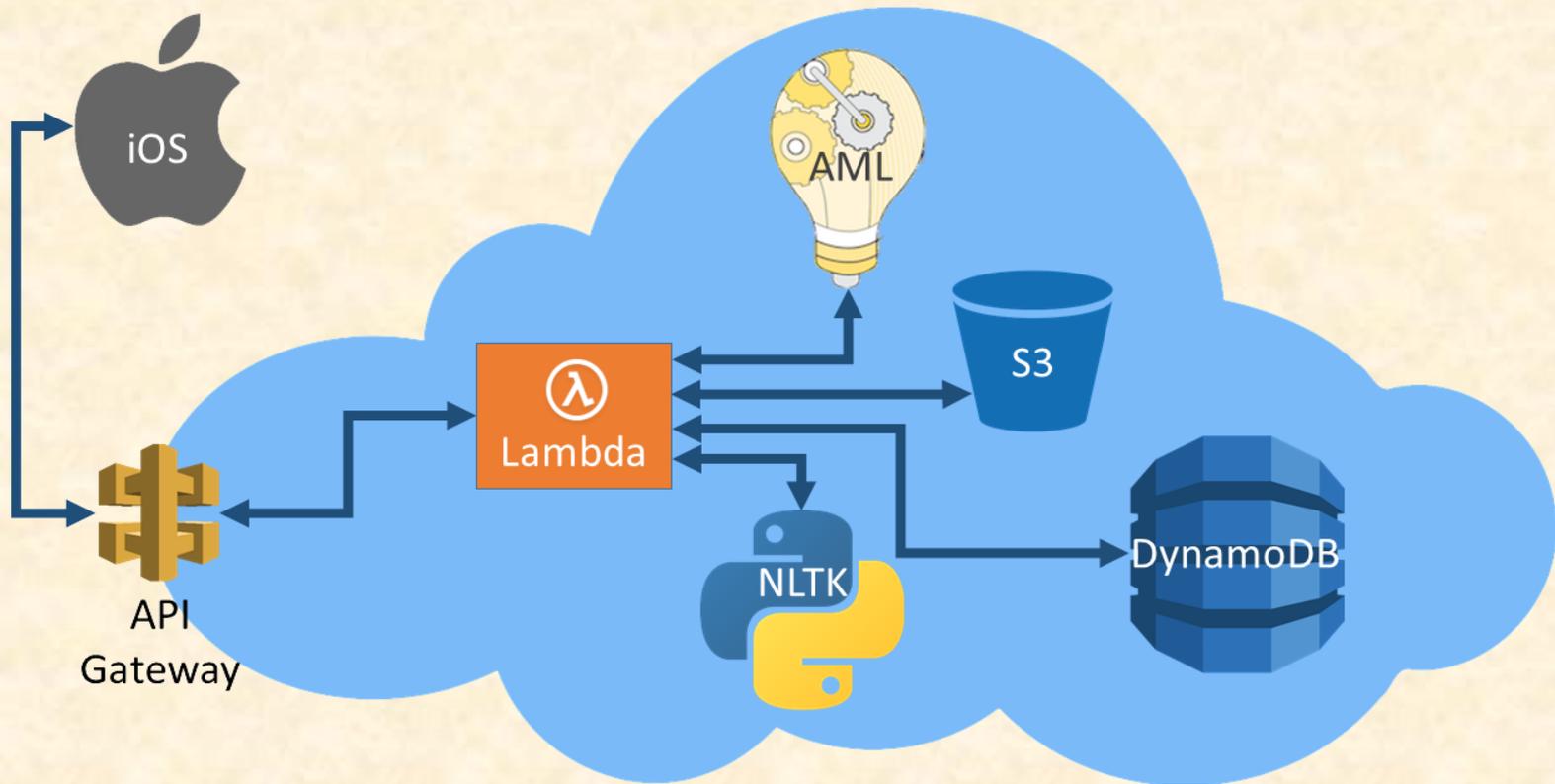
Technical Specifications

- Michigan State University
 - Apple iPads and iPhones (iOS) / Swift
 - Google Android Tablets and Phones / Java
 - RSS News Feeds
- Microsoft
 - Microsoft Intune
 - Microsoft Graph
 - Microsoft Windows / C#
 - Google Android Tablets and Phones / Java
 - Apple iPads and iPhones (iOS) / Swift
 - RESTful Web Services
- Mozilla / Firefox
 - CSS
 - JavaScript
 - Python
 - XUL / XBL
 - Mercurial
 - IRCCloud
 - Bugzilla
 - Review Board
 - Windows
 - OS X
 - Linux

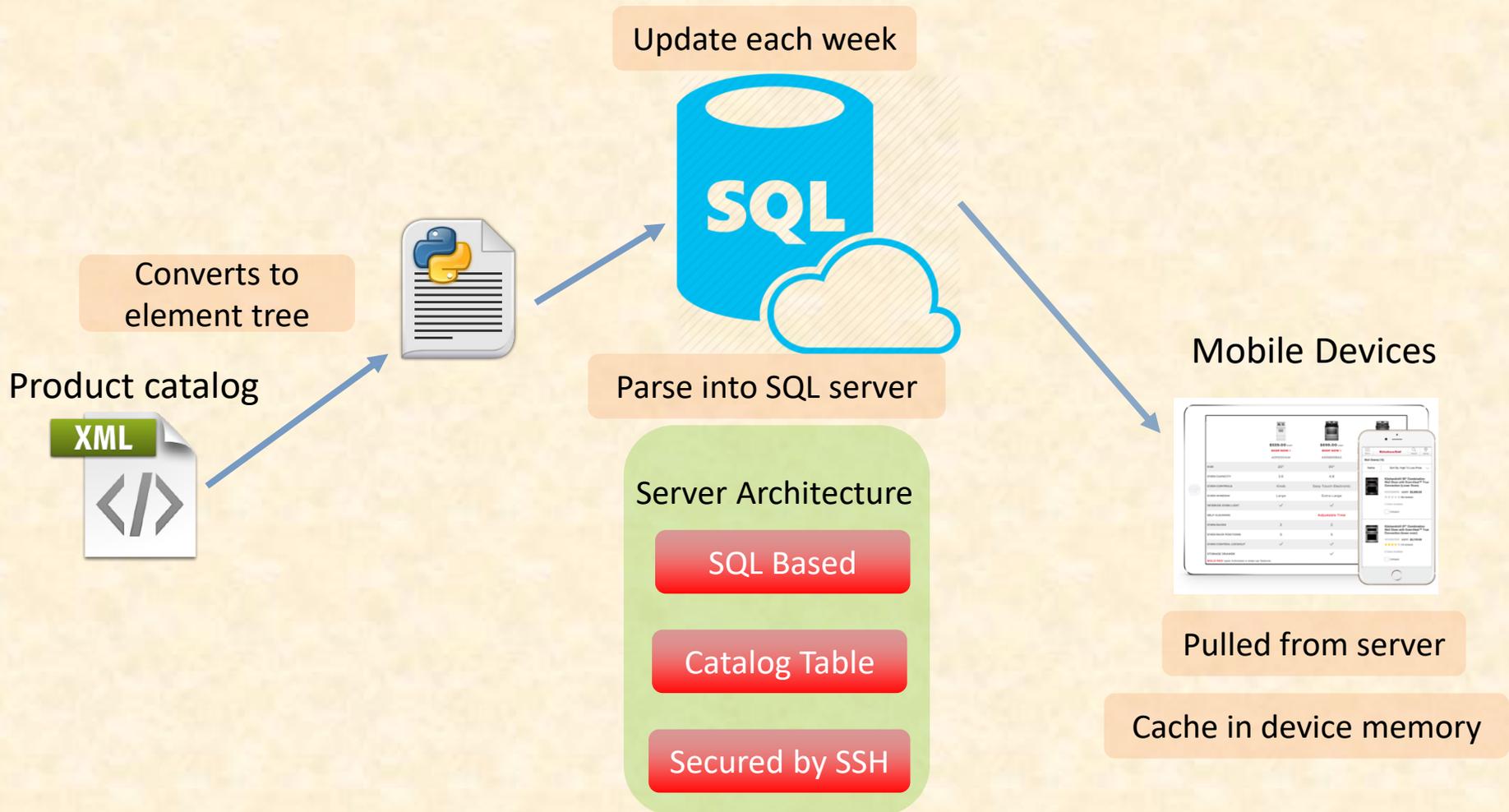
Probably Not
Understandable
by End User



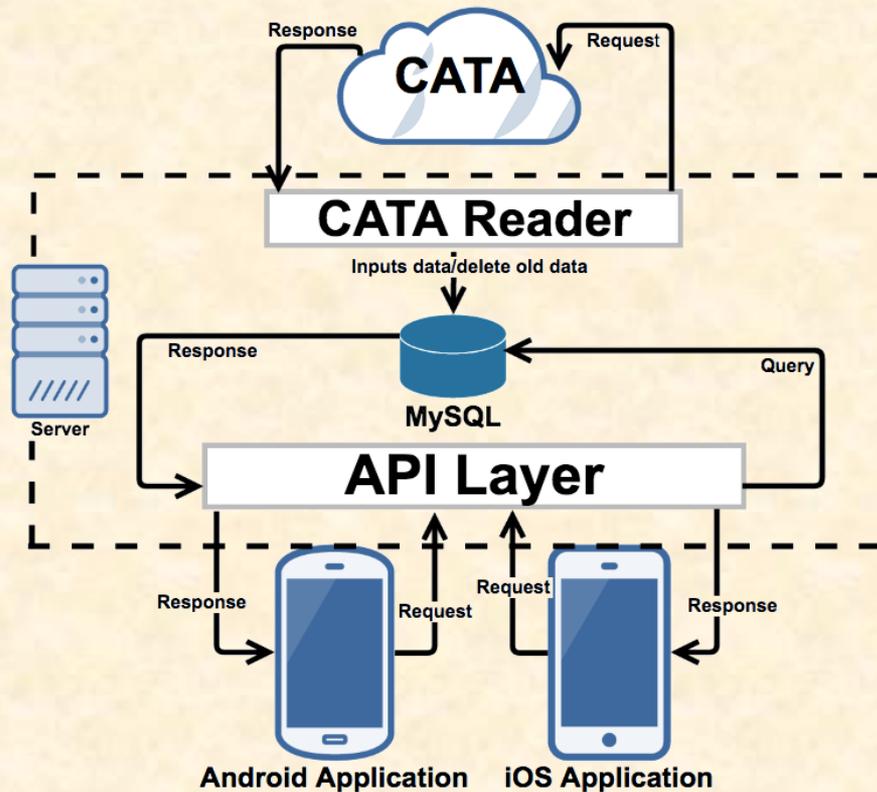
System Architecture Example



System Architecture Example



System Architecture Example



Approach

- Break Big Problems Into Smaller Problems
- Identify Constraints
- Identify “Risks” — Things You Don’t...
 - ...Know
 - ...Understand
 - ...Know How To Do
- Consider Tradeoffs
- Select Appropriate Technologies
- Identify Core Features for a Prototype



Technical Specifications Interactions With Your Client

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Cannot be emphasized enough!

Project Plan Summary

- Specifications
 - Functional: What does it do?
 - Design: How does it look and feel?
 - Technical: How does it do it?
- Testing Plan
- Schedule

How To's

[1 of 4]

- Quickly identify...
 - ...what you don't know,
 - ...what you don't understand, and
 - ...what you don't know how to do.
- Conceptually...
 - Start with functional specifications.
 - Get agreement with client.
 - Include as first part of project plan.
 - Do design specifications.
 - Get agreement with client.
 - Include as 2nd part of project plan.
 - Do technical specifications.
 - Get agreement with client.
 - Include as 3rd part of project plan.
 - Do schedule.
 - Do development, testing, and deployment.
- In CSE498, must do all three in parallel (and iterate).



How To's

[2 of 4]

- Approach

- Make Skeleton Document Immediately
 - Will Get You Organized and Focused
 - Include “Under Construction” Sections (Totally Empty)
- Develop In Parallel When Possible But...
 - Complete Functional First
 - Complete Design Second
 - Complete Technical Third
- Refine As Needed
- Assign Sections to Team Members
- Share with Client
 - Ask For (Specific) Feedback ← “Is this what you had in mind?”
 - Highlight What's New
 - Tricky Balance
 - ❖ Not Enough?
 - ❖ Too Much?



How To's

[3 of 4]

- Schedule
 - Dictated by Course
 - Schedules > Major Milestones
 - 09/13: Status Report Presentations
 - 09/18: Project Plan Presentations
 - 10/16: Alpha Presentations
 - 11/13: Beta Presentations
 - 12/04: Project Videos
 - 12/06: All Deliverables
 - 12/07: Design Day Setup
 - 12/08: Design Day
 - Other Milestones By Educated Guesses
 - Track To It At Least Weekly at Triage Meetings
 - Revisit Often and Revise If Necessary
 - Delivery Slippage == Graduation Slippage



How To's

[4 of 4]

- “Living Document”
- Make Sure Your Project Plan Has...
 - Cover Page
 - Title
 - Table of Content
 - Page Numbers
 - Headers and Footers
 - Etc...

(That is, make sure your plan looks professional.)



Interactions With Client

Client May Specify...

- Requirements
 - Functional
 - Design
 - Technical Requirements
 - Operating Systems
 - Programming Languages and Environments
 - Web Technologies
 - Etc...
 - Legacy
- Milestones
- Etc...

(You may explore and propose other ideas.)



Nota Bene: Project Plan

- Must Use Windows Microsoft Office
 - Word and PowerPoint
 - Included with Windows 10 VM.
 - Get it done now!
 - (Do not attempt to use anything other than Windows Microsoft Office.)
- How many...
 - ...drafts will you write? Many.
 - ...drafts will you share with your client? A Couple.
 - ...final documents will you submit for CSE498? One
- Due Date
 - 4:00 a.m., Monday, September 18
 - < 2.0 Weeks
- In Class Formal Presentations  Get on it, now!
 - September 13 – September 27
 - PowerPoint Template Provided



Resources on the Web

- Other Links > Downloads
Project Plan Examples

- **Fall 2016**

- Team Amazon
- Team Rook
- Team Whirlpool

- **Spring 2017**

- Team Microsoft
- Team MSUFCU
- Team TechSmith

- **High Resolution Sponsor Logo**

www.capstone.cse.msu.edu/2017-08/projects/<sponsor>/images/originals/sponsor-logo.png

<http://www.capstone.cse.msu.edu/2017-08/projects/auto-owners/images/originals/sponsor-logo.png>



Project Plan

✓ Functional Specifications

✓ Design Specifications

✓ Technical Specifications

• Risks and Prototypes

• Schedule and Teamwork

} Future Meetings

